GrummanWorld

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Grumman To Study Space Defense Weaponry

Under Army contract, Grumman working on concepts for particle beam weapon for SDI

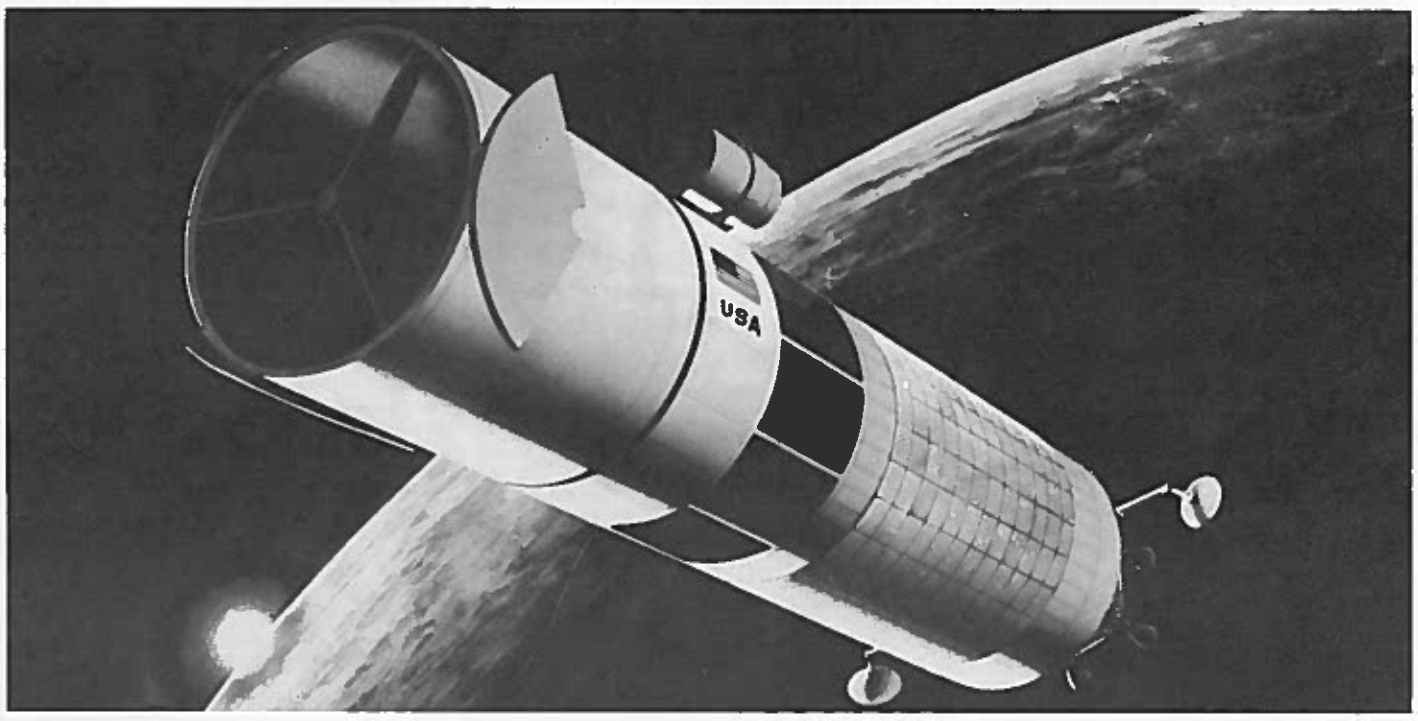
Grumman's technological know-how has put the company smack in the middle of anti-ballistic missile weapons research.

Grumman is one of three winners among 20 competitors for the Concepts and Requirements Definition Study (CARDS) of space-based neutral particle beam (NPB) research.

CARDS is a small contract, worth less than $3 million and involves a total of 30 people. But it's one of the critical technologies being studied as part of America's Strategic Defense Initiative (SDI) program, better known as "Star Wars."

Grumman leads a team that includes Science Applications International, Bendix, Ford Aerospace and Communications, Garrett, Lockheed, and the Texas Accelerator Center. The team delivered its first requirements study to the Army's Strategic Defense Command (USASDC) in December.

According to program manager Bob Papsco, this program is designed to help USASDC determine whether this technology is workable and how to go on to the next step. "This program will guide the development work," he says. "In July, we'll deliver the concept description, then the research and development plans in the fall. The CARDS program ends next year. Follow-on contracts for the technology validation could possibly come after that."



ZZZZZap. *Neutral particle beam (NPB) belongs to a class of space-based weaponry called directed energy. This artist's conception shows what another type of directed energy weapon – a laser – might look like. NPB weapons are technologically related to fusion reactors. Grumman's assignment is to see if NPB technology would work in space.*

Teams led by Grumman, Boeing and Teledyne-Brown are performing these concept studies.

In March 1983, President Reagan put the technological wheels of SDI in motion. SDI calls for conducting research on an anti-ballistic missile defensive capability that would negate the threat from strategic offensive nuclear weapons.

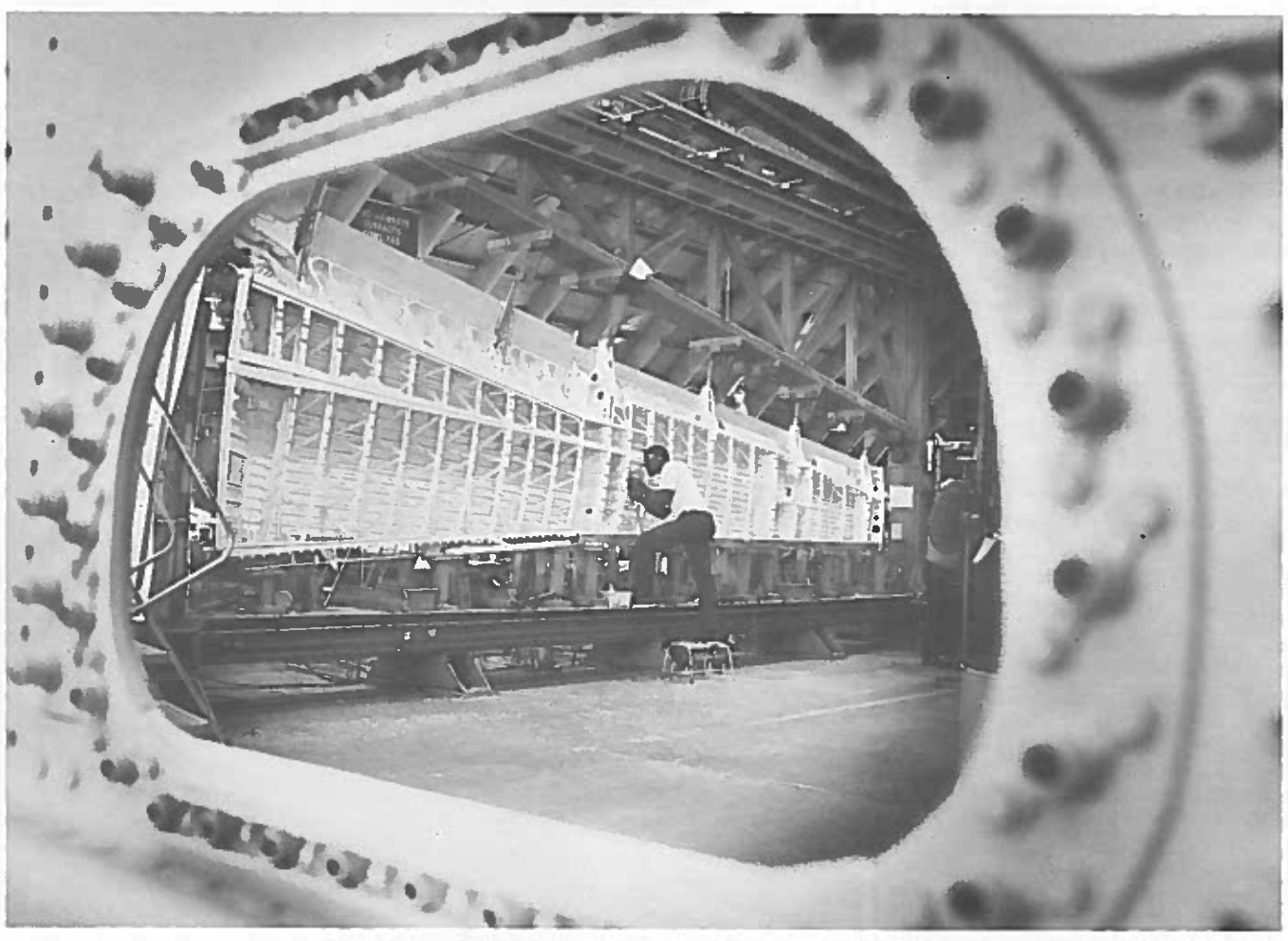
Determining how ballistic missiles could be shot down is not easy.

In June 1984, the U.S successfully validated technology to show the feasibility of achieving non-nuclear kills outside the atmosphere. At incredible speed, the ground-launched vehicle raced toward an incoming reentry vehicle, opened up an umbrella-like mechanism and smashed its target.

But that is just one of many technologies being studied, including the neutral particle beam. This "zapper" would focus so much energy on a target that it would blow it up or burn out its electronics, making it useless. It's the same science used in nuclear fusion reactors, and that's where Grumman has an edge on many competitors. "We started working with the Princeton Plasma Physics Laboratory on the Tokamak Fusion Test Reactor 10 years ago," says Papsco, who was Grumman's project manager on Tokamak. "We still have about 15 people there."

The NPB weapons would lock on to attacking missiles, focus the energy into a tight beam, neutralize the charge of the atoms so that they aren't pulled off target by magnetic fields in space, then fire the beam of speeding atoms at the ballistic missile.

The idea works on paper. Whether it will work in practice is up to the Grumman team to find out. ■



Winging It In Stuart. *Brent Brown assembles E-2C wings in Stuart, Florida. While their workplace is known as Mohawk Country, Grummanites in Stuart Operations also build wings for the Hawkeye and the C-2A Greyhound, and a variety of other subassemblies for both Grumman and subcontractors. (Photo by Bob Settles)*

What's Inside

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Company Match In Investment Plan Drops To 75 Percent In 2nd Quarter

For the second quarter of 1986, the company's contributions to the Employee Investment Plan will decrease from 82 percent to 75 percent. For every dollar an EIP investor contributes – up to four percent of pay – the company will contribute 75 cents worth of company stock.

In January 1977, Grumman began "floating" its matching contributions to the Employee Investment Plan between 50 and 100 percent based upon its financial performance during the preceding four quarters. The 1986 second quarter match is based on Grumman's performance for the four quarters of 1985.

As reported last month, net income for the fourth quarter of 1985 was $23.1 million. For the same period in 1984, net income was $28.1 million. This decline was attributed to lower profit margins on aerospace sales, a $3 million loss on the sale of Pearson Yachts, and costs from discontinuing solar energy operations.

Unfortunately, these fourth quarter earnings will affect the company match for the last three quarters of 1986 and the first quarter of 1987, since the match is based on performance in the preceding four quarters.

In addition, the third quarter earnings – which included a $30 million charge to redesign and repair the F-14 main leading gear bulkhead – will continue to have an impact on the company match throughout 1986. It was the third quarter results which triggered the drop in company match for the first quarter of 1986 from 100 percent to 82 percent.

The company match is affected by past company performance in the preceding four quarters. For instance, the drop to 82 percent for the first quarter of 1986 was influenced by the addition of the poor third quarter results of 1985 and the dropping of the strong third quarter results of 1984.

Chairman Jack Bierwirth called 1985 a year of continuing development and he expects Grumman's need for major investments to continue for at least two more years.

The company is investing heavily in the future. In February, Grumman raised over $200 million through the sale of common stock and two debt offerings. The F-14D and A-6F development programs for the Navy are being performed at no profit. Several other programs potentially worth billions of dollars also require research and development funding.

The ongoing capital investment program to modernize Grumman facilities and equipment to accommodate this work will cost Grumman $180 million alone in 1986.

In addition, the Defense Department decided in 1985 to reduce progress payments from 90 percent to 80 percent. This change cost Grumman millions of dollars last year. The same is expected in 1986. ■

Birds Of A Feather. *When you're far away from home, there's nothing like having a member of the family nearby. At Edwards Air Force Base in California, the Grumman X-29 (foreground) continues its successful flight test program. It recently flew its 36th flight and now has accumulated close to 50 flight hours. Meanwhile, a Grumman F-14 (background) is also at Edwards. NASA is putting a mirror-smooth surface of fiberglass and foam on the Tomcat's wings to try and cut drag. (Photo by Rich Breunig)*

New England Bell Picks Up More Servmods From Mayfield

New England Bell is now taking delivery of its second order of Servmods. Built in Allied's Olson truck body facility in Mayfield, Pennsylvania, Servmods feature modular cabinet units that are mounted on pickup truck chassis. They're perfect for carrying tools and parts for repair crews.

"We've delivered 100 out of the 271 Servmods that New England Bell has ordered. It's worth over a million dollars in business to us," says general manager Bob Hickey. Last year, Olson's Mayfield facility completed an earlier order of 160 Servmods for New England Bell.

Mayfield's work force dropped slightly towards the end of 1985. However, the Mayfield team has grown steadily this year, according to Hickey. The work force is now larger than last year's peak level. Hickey says that the New England Bell contract is just one of the reasons for this growth.

"Our rebuilding work is going good," says Hickey. Mayfield's largest operation is the rebuilding of trucks from the chassis up. "We're doing a lot of diesel conversions, too."

For less than half the price of a new truck, Grumman will take apart a customer's old aluminum vehicle, repaint the body, replace the engine, make repairs, replace parts, and then rebuild the whole truck. Essentially, customers get a brand new truck. Last year, Grummanites in Mayfield rebuilt 40 of the large Kurbmaster delivery vans for the *Philadelphia Inquirer*. ■

Finishing Touches. *Inspector Joe Yaworske (L) checks a completed Servmod unit, while John Shader files a couple of rough spots to make it perfect. It was mounted on a pickup truck chassis and delivered to New England Telephone as part of a 160-unit order.*

Employee Investment Plan Members Invited To April 3 Annual Meeting

The annual meeting of the Grumman Employee Investment Plan takes place Thursday, April 3. All plan members are invited to attend the meeting, which starts at 5 p.m. in the Grumman Headquarters' auditorium.

Representatives of the firms that manage the equity, fixed income, and guaranteed income funds will be present as well as representatives of the bank recordkeeper.

There will be reports on the performance of the plan's funds over the past year and projections of their future performance. Attendees will have the opportunity to ask the plan's managers questions.

So that a maximum number of inquiries may be answered, the Employee Investment Plan office suggests that you fill out the form on this page if there are certain topics you would like discussed. These suggestions are important – the evening's agenda is usually planned around them. Mail your inquiries to the Employee Investment Plan, C15-GHQ.

A summary of the meeting will be published in an upcoming issue of *Grumman World*. ■

Investment Plan Inquiry

I'd like to have the following topic discussed: .....
.....
.....
.....
.....

Mail to: EIP, C15-GHQ

Obituaries

Robert T. Burns, Material Management, Aircraft Systems, Bethpage, died Feb. 16 at the age of 55. He had been with the company since 1956 and resided at 11 Gaymor Rd., Hauppauge.

Thomas J. Caccamo, Static Test, Aircraft Systems, Bethpage, died Feb. 7 at the age of 61. He had been with the company since 1965 and resided at 4198 Harriet Rd., Bethpage.

Leslie E. Grgas, Vehicle Drafting, Aircraft Systems, Bethpage, died Feb. 21 at the age of 25. She had been with the company since 1981 and resided at 163 Washington St., Farmingdale.

Ernest Houser, Machine Inspection, Aircraft Systems, Bethpage, died Feb. 14 at the age of 61. He had been with the company since 1952 and resided at 15 School House La., Syosset.

Susan J. Sachman, Office Management, Services, Bethpage, died Feb. 23 at the age of 25. She had been with the company since 1979 and resided at 147-41A Lake Shore Dr., Lake Ronkonkoma.

Old Tomcats Come Back To Calverton For Update

After more than a decade, 25 of the first production F-14 Tomcats are returning to Calverton for a complete overhaul.

Built from 1969 to 1971, the 25 aircraft are for U.S. Naval Reserve Squadrons VF-201 and VF-202 in Dallas, Texas. The planes are numbers 13 through 38 of the Block 60/65 configuration. Valued at approximately $70 million, the Block 60/65 Update Program will bring these aircraft up to the current production F-14 configuration.

"We're approaching this as a remanufacturing task because many of these F-14s have been in long-term storage," says Bob Carlo, program manager for the Block 60/65 Upgrade Program. "These F-14's are going to require a significant amount of work to bring them up to the current configuration."

Under the Navy contract, Grumman will install an average of 250 changes in each aircraft, completely rewire the airframes, install a new avionics package and reworked Pratt & Whitney TF-30-P414A engines, perform standard maintenance, and deliver a full mission-capable aircraft.

The job will involve work at a number of Grumman sites. Stuart, Florida, will build new tail sections to the current production configuration. Milledgeville, Georgia, will modify the upper speed brake panels, which fit on the rear of the fuselage between the stabilizers.

On Long Island, wings and canopies will be rebuilt in Bethpage. Great River will fabricate the electrical harnesses, panels and black boxes. Modification work, final assembly and flight tests will take place at Calverton.

The Naval Aircraft Rework Facility (NARF) in Norfolk, Virginia, will refurbish the Tomcats' Pratt & Whitney engines, landing gear, ejection seats, fins, and update approximately 150 avionic boxes or assemblies.

"This is truly a team effort. That's the way it has to be with the incredible amount of work these aircraft need," says Carlo.

These early Tomcats will be returning to their birthplace from different locations around the country. Three will come from the Davis-Monthan Air Force Base aircraft storage facility near Tucson, Arizona, eight from storage at NARF Norfolk in Virginia, and one from Boeing in Seattle, Washington.

The remaining 13 Tomcats have been in use by the Navy's Research, Development and Testing Centers at Patuxent River, Maryland, and the Pacific Missile Test Center at Pt. Mugu, California, for a variety of experimental projects. These aircraft must have the experimental equipment and airframe changes removed before starting the job of bringing them up to the current production configuration.

The program runs for 30 months. The first remanufactured Tomcat will be delivered in December 1986, the last in the spring of 1988. ■

Travelling By Guppy. *An old Tomcat returned to Calverton aboard NASA's transport plane called the Guppy. Grumman will modify this F-14 and 24 other early production Tomcats to the current production configuration. Called the Block 60/65 Program, the modification work is valued at approximately $70 million. (Photo by Karl Thoma)*

Getting To The Point. *Aerodynamicist Kurt Chankaya is working on a futuristic delta wing called the Vortex Aerodynamics Wing. In this test, he passes a sheet of laser light through a stream of smoke to study the effect on leading edge flaps. The flaps reduce drag during combat maneuvering. (Photo by Jim Wagner)*

Houston To Build Sanitation Units For Navy's New Field Hospitals

Under a $12.8 million contract, Grumman Houston will manufacture 747 sanitation system shelters for the Navy's battle-zone hospitals.

There will be three types of the 8 x 8.5 x 20-foot shelters: a freshwater unit housing the water supply; a unit housing three showers, three sinks, and three toilets; and a unit for the wastewater tank.

The hospital will be a one-story cluster of temporary buildings with several hundred beds, operating rooms, X-ray labs, a pharmacy, and other medical facilities.

"The mobile hospital is designed to be set up in three days," says Art Fichtner, program director - Mobile Sanitation Systems. "It will be used wherever and whenever a Navy hospital has to be erected."

Assembly starts next month, and the first production systems will be delivered in September. The program will run through January 1988.

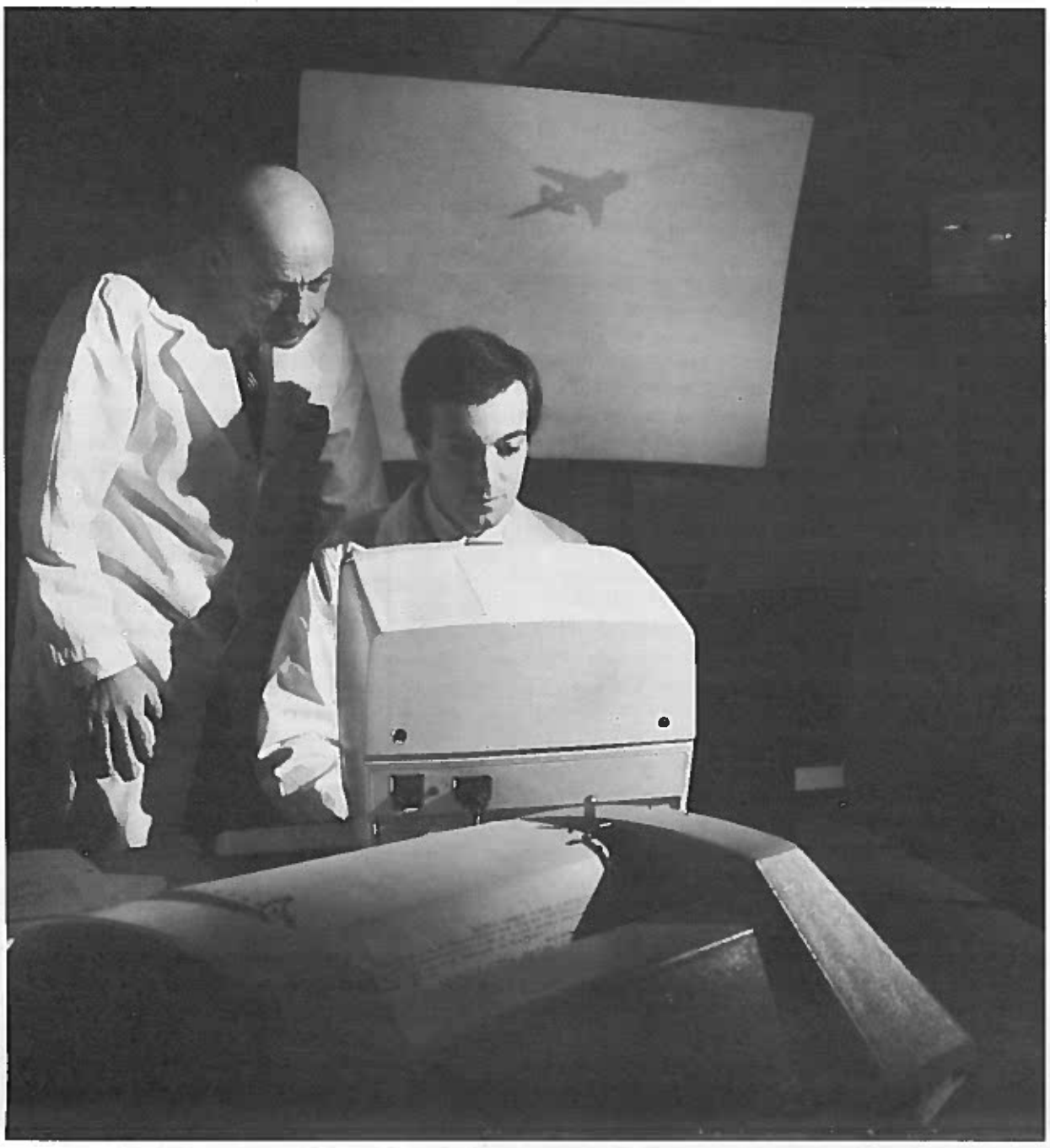
The program will be getting well under way at the same time that Grumman Houston's contract with Sperry Corporation will be winding down. That contract involves the production of trailer-like field shelters for U.S. Air Force base support computers. The last of these shelters will be delivered in August, although there's some possibility that Sperry will order additional shelters.

Fichtner notes that the new program will require no increase in work force, and will employ the same mechanical and electrical assembly skills as the Sperry program. There will be no need for retraining.

The the program involves a host of suppliers. "Everything has been competitively bid, according to Navy regulations," he says. "Parts are coming from everywhere from New York to California. The shelters are being fabricated in Taiwan." ■

Let Us Know

We'd like to know what you think about the things you see in these pages, and what you see going on in the company. Letters to the editor should be addressed to *Grumman World*, 1111 Stewart Avenue, A22-GHQ, Bethpage, N.Y. 11714, and should include your name and address. Letters may be edited for clarity or space.



Studying Thought Processes. *Below, Jay Mendelsohn (L) and Alex Peck program the computer. The lab is exploring the use of computer software to teach a machine to see and reason about what it sees. The large display in the background shows a computer-generated image of the X-29 in flight. The smaller display shows a tank formation.*

Vision Quest. *This picture is taken from a film used by the image processing laboratory to study computerized methods for locating targets. The technique used to create the scene fools the eye into thinking it contains more detail than it actually does. As a result, the lab saves time on computer programming.*

Using High-Tech Research Teach

The screen fades into rolling hills, trees and, in the sky, the swirling clouds of an approaching thunderstorm. In the distance, a column of tanks winds its way into view.

The film makers never left Bethpage, Long Island – in fact, they didn't even go outside. The video was produced at the Grumman Corporate Research Center's image processing laboratory in Building 26.

Part of the lab's role is research in synthetic image generation, which couples highly complex computer software with video cameras and other devices to produce very realistic visuals.

> 'The idea is to make machines autonomous. You stay safe – you let the machine do the unsafe work. Such a concept is enormously attractive in the military world.'

More important, the films and videos serve as a control subject for the lab's main areas of research: artificial intelligence and image processing, and how they apply to target recognition by military systems.

Artificial intelligence seeks to bestow upon machines the human power to reason. The Grumman lab specifically studies visual reasoning – research that could lead to computer systems, aircraft, and robots equipped with both sight and sense.

"Reasoning consists of memory examination, learning, and deduction," says Jay Mendelsohn, a scientist in the Corporate Research Center's System Sciences Directorate and head of the lab. "The mechanics of vision are clear. How the brain processes images is an entirely different matter.

"The idea is to make machines autonomous," Mendelsohn points out. "You stay safe – you let the machine do the unsafe work. Such a concept is enormously attractive in the military world.

"People only use a small portion of their brainpower. The same can probably be said about computers," he adds.

One goal is to learn how to program machines to recognize objects of interest. In military hard-

> 'Computer image generation can, theoretically, generate an infinite number of scenes.'

ware, that means spotting targets. Thus, the lab's research has application in both present and future Grumman aircraft.

The films use a concept first developed by the Impressionist artists a century ago. "Edges of objects are rather blurry, and the eye is fooled into thinking a picture contains more detail than it actually does," says Alex Peck, a research engineer at the lab.

Julius Kim, an associate research scientist at the lab, recently completed a videotape showing a tank formation advancing across a landscape of fields, trees, and cliffs. To create the images, he used a set of scenic photographs of upper Michigan – and a topographical map.

The first of Kim's films appeared fairly realistic. All the details of the actual setting were in place – right down to the tree stumps. The film will

Camera Tricks, s Computers To Track Targets

be used to study computerized methods for locating the targets – tanks – contained in its scenes.

In a second film, the same setting was used, but in an entirely different coloration. It's an infrared version. In the infrared spectrum, the color of objects is determined by the amount of heat they generate. This is quite different from the visual spectrum, where color is determined by objects' light-reflective abilities.

The films were done for an Army Tank Command contract to study image generation in the infrared wavelength. In the film, trees are blue and black, the "cool" colors. Meanwhile, the tank has hues of orange, yellow, and white. The white part is where the engine is – the hottest element in the picture.

"Most military sensors of the future will be heat seekers," says Mendelsohn. "Our research will be valuable in learning how to get hardware to 'see' that infrared spectrum."

Image processing can be loosely described as using computers to find the needle in a haystack.

An object is photographed, then digitized and entered into a computer memory. The lab then processes it through a computer program. The result is called a matched filter. Using it, the computer will be able to discern if a like object is present in a photograph or other image – a primitive form of visual reasoning.

The lab recently completed work on another Army contract, studying pattern recognition by computer. "We researched getting the computer to find the targets in a picture," says Mendelsohn.

In artificial intelligence research, synthetic images are a good first step because lighting and visual elements can be tightly controlled, and images altered or enhanced as required.

"The goal is to teach a computer to see – image processing – and think about what it sees – artificial intelligence."

Matched filtering also came into play in a recent Air Force study contract, which Mendelsohn and Dave Englund, a senior programmer with the Data Systems Division, worked on together. The problem was to teach an industrial robot to locate the parts that make up an F-14 bulkhead and then assemble it.

"Our lab studied the vision portion of the research, and showed that it could be done by match filtering," says Mendelsohn. "In the next phase, we'll produce the software and systems analysis. The hardware is being developed in the Corporate Research Center's electrophysics lab."

Matched filtering can be used in intelligence and reconnaissance photography. An object may be too far in the background for the eye to see, or it might be camouflaged. Match filtering can help find it.

Image processing methods, developed to locate seemingly invisible objects, can also be used to support programs whose goal is the opposite: to hide valuable military assets from the enemy. A scene using a camouflage technique could be generated by the computer, and its effectiveness evaluated.

The lab's research has application for many Grumman divisions. "For Electronics Systems, we're looking at translating a method of finding targets in complex backgrounds into a way to spot errors in printed circuit boards," says Mendelsohn.

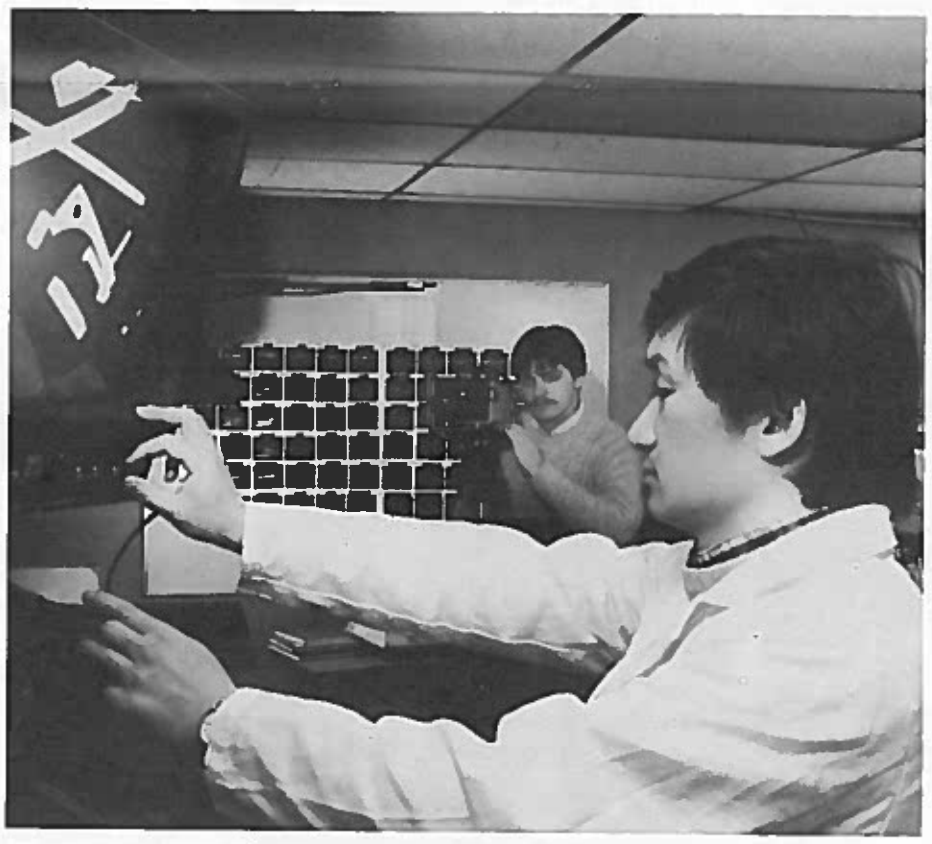
Because synthetic images and image processing require highly complex computer equations, the lab requires an enormous amount of computer power. Though it has its own super-minicomputer to speed things up, the lab is wired directly to the Cray supercomputer in Grumman Headquarters.

For example, it takes five minutes to generate a film frame using the lab's super-minicomputer. Multiply that by 24 frames per second – the standard film advance speed – and several hours can be spent on just a few minutes of film. However, the Cray can reduce the time to a few seconds per frame.

Wouldn't it be easier just to go out on location and shoot a lot of footage? "Not really," says Peck. "There's only so much you can go out and shoot with a movie crew." In artificial intelligence research, synthetic images are a good first step because lighting and visual elements can be tightly controlled, and images altered or enhanced as required.

"And with computer image generation, you can, theoretically, generate an infinite number of scenes," says Peck.

Computerized Fakery. *Alex Peck holds a picture of the X-29 in flight taken from a film produced by the image processing lab. The film preceded the actual first flight of the aircraft by several months.*



Fine Tuning. *Julius Kim (foreground) and Dave Englund are getting ready to create a matched filter. Kim adjusts the video monitor while Englund focuses on the subject: E-2C detail parts. Later, the video information will be processed through a computer program. The matched filter will be used by a computer to discern if like objects are present in another image.*

Elsewhere, synthetic imagery is playing a major role in the movie industry. Producer George Lucas relied heavily on it for visual effects in the three "Star Wars" movies. Lucasfilms also uses a Cray computer.

One of the side effects of Mendelsohn's research has been a keen eye for detail in photographs. After-hours, he has often worked with the Nassau County Police Department, as well as police departments in New Jersey and Connecticut. Typically, he is asked to study bank robbery photographs, which he magnifies, enhances, and dissects.

"Usually, the robbers are wearing masks, so I have to look for other things – such as the robber's wristwatch, jewelry, numbers on the gun, scars. Anything can help identify something about the person in the photo," he says.

Mendelsohn points out that while the image processing lab has been around for close to a decade at Grumman, it has only recently begun to explore artificial intelligence. "We're really just getting started," he says. "Things that are difficult or dangerous to do could be done by machines, giving people freedom to concentrate on the creative tasks they do best.

"The pilot's ability to process and interpret high rates of sensor data are limiting today's product. Hopefully, artificial intelligence holds the answer to this problem. So, there are all kinds of programs that our research can support. The possibilities are as far-reaching as the imagination." ■

System Centurians Solve Case Of The Tangled Cables

Four members of the quality circle "System Centurians" recently spent a Saturday untangling over 200 under-floor cables in Personnel and Administrative Operations' computer center.

The center is on the third floor of Grumman Headquarters. Most of the departments in Personnel and Administration are now using computer systems, and this is where they are all linked.

The Centurians' project made the installation of a brand-new Wang VS-100 computer much easier. It will also greatly ease future installations.

"Even though the cables were all marked as to where they went – concourse, first floor, second, or third – they were all mixed together," says Bob Joyce, manager of Personnel and Administrative Operations and leader of the quality circle. "So it was a hit-or-miss operation to find one to connect to a new piece of equipment."

The night before the big operation, associate analyst Bill Wells removed all the cables from the VS-85, carefully labelling them according to what outlets they belonged in. Meanwhile, senior analyst Kevin Long took up most of the floor tiles in the room.

In addition to locating the right cables to plug into the new computer, the crew restrung and bundled all the rest according to department and floor. Now, there's a map on the wall telling just where each bundle is.

Long and systems analyst Pat Guidice worked on one side of the room, passing cables to Wells and Joyce on the other side. "They're all Teflon-coated coaxial cables," says Joyce. "They're not too flexible."

"We had talked about spending a leisurely five hours on it, but we ended up working 10 1/2 hours," says Guidice. "At the end, we ran around all four floors checking every single workstation – and it came up perfect."

Says Wells, "It now takes five or 10 minutes to locate the right cable. Before, we had to pull up most of the floor every time."

As a quality circle project, the idea was first presented to management, which gave it an enthusiastic thumbs-up. This was System Centurians' first project.

Any department in any Grumman division can start a quality circle, with management approval. Most of the current circles are in the Aircraft Systems Division, but there are also circles in Electronics Systems, Data Systems, Services, Technical Services, and Grumman Corporation.

The Quality Circles program helps groups get started. For more information, call Joyce Sparling at (111) 58305. ■

Under-Floor Handiwork. *Kevin Long, Pat Guidice, Bob Joyce, and Bill Wells display the computer cables they recently rearranged in the Personnel and Administrative Systems computer room. The project took them an entire Saturday to complete.*

Putting His Stamp On His Work. *Jerry Hines stamps out ribs for a 17-foot Grumman canoe at the Allied Division's Marathon, New York, facility.*

Summer Jobs '86

Summer employment application forms for dependents of Grummanites in all divisions are available at Employee Services' Flight Shops and in the Employment Office in corporate headquarters.

Those seeking summer employment must be active, full-time students who have completed at least one year of college, who are not graduating this June, and who are continuing their education full-time in the fall toward associate's or bachelor's degrees.

This year's program will begin May 27 and continue until August 29. Students are expected to work a minimum of eight weeks.

Summer positions are limited. Selections are based on the years of the parent's company service, student interest and the availability of job openings.

Application deadline is Tuesday, April 8. Applications should be submitted to Employment, C07-GHQ. If you have any questions, contact Renee Cox, Ext. (111) 59385 or Peter Portanova, Ext. (111) 50683.

Retiree Obituaries

Marie C. Ruggio of 1336 Jericho Rd., East Norwich, N.Y., died Feb. 14, 1986. She retired in 1973.

George R. Saxton of 17 Glenwood St., E. Patchogue, N.Y., died Feb. 17, 1986. He retired in 1980.

Harry V. Bartik of 2540 Chestnut Ave., Ronkonkoma, N.Y., died Feb. 25, 1986. He retired in 1972.

George A. Gajewski of 8 Scherer St., Bethpage, N.Y., died Feb. 26, 1986. He retired in 1985.

Anastasio Martino of 123 SW 53 Terrace, Cape Coral, Florida, died Jan. 24, 1986. He retired in 1962.

William O'Connell of 727 Lowell Rd., Uniondale, N.Y., died Feb. 21, 1986. He retired in 1975.

John Pandolfa of 355 Harrison Ave., Massapequa, N.Y., died Feb. 17, 1986. He retired in 1969.

Personals

My family and I wish to thank all my friends, co-workers and ESO for their kindness and thoughtfulness after the recent loss of my mother. **Milt Schneider and Family**

My sister, brother and I wish to thank all my friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of our mother. **Theresa Donlon**

My family and I wish to express thanks and appreciation to all our friends for their thoughtfulness and sympathy during the recent loss of my wife Renee. **Ed Romano**

My family and I wish to express our appreciation for the thoughtfulness expressed by my friends, co-workers and ESO during the recent loss of my father. **Don Zielinski and Family**

My family and I wish to thank our friends at Grumman for their sympathy and thoughtfulness during the recent loss of my wife Viva. Your donations to the Anawim Healing Center are greatly appreciated. **Bill Fox**

The family of Dan Burford is very grateful for the concern and caring expressed by so many of Dan's associates at Grumman after his death on December 17th. Your thoughtfulness has helped to make this difficult time easier. Thank you. **Sue Burford and daughters**

My family and I wish to express our sincere thanks and appreciation to all our friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of my father. **Bernard Sloan**

A sincere thanks to all my co-workers and ESO for their thoughtfulness and expressions of sympathy during the recent loss of my father. A special thanks to the field base administration personnel for their kindness and help during this difficult time. **Dave Reichel**

I wish to thank all my friends, co-workers and especially the personnel in Building I for their thoughtfulness and sympathy during the recent loss of my wife. **Sal Tranchina**

My family and I would like to express our sincere thanks and appreciation to all my co-workers and ESO for their kind expressions of sympathy during the recent loss of my father August. **Joe Dornicik**

We wish to thank our friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of my mother. **John Gross and Family**

Retirees

On behalf of our fellow workers, *Grumman World* salutes the following Grummanites for their contributions to the company and wishes them well in their retirement. Those who have recently retired are:

Dominick Capozzi (2), Marjorie S. Eckstein (5), Anna Wicks (GC), Kenneth F. White (43), James E. Crane (6), Richard M. Quinn (4), Anthony W. Forte (2), Vincent J. Corrado (40), John Simonetti (3), Walter J. Budd (1), Raymond D. Hirsch (III), Henry J. Coppola (18), Newel Crawford (66), Rudy Friedenthal (15), Richard E. Mauck (7), Peter J. Brenna (6), Paul Hammers (1), Julius F. Tworzyanski (7), Frank J. Horsch Jr. (12), Marion Eckhoff (GII), Charles A. Savage (40), James E. Lindsay (6), Robert T. McCall (2), Edward L. Betz (1), Frank Mastorides (5), William Clark (35), Harold T. Johnson (5).

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Papershuffling Gets Canned By New Data System

On February 18, the planners of Material Management happily flung volume after volume of data right into the garbage.

Corporate Requirements System (CRS) 2.0 had just been turned on, ushering in the start of the paperless handling of parts manufacturing data for Grumman products.

Since 1980, Data Systems Division and Aircraft Systems' Material Management have been developing CRS 2.0. The "2.0" means second generation, but comparing its performance to the first generation CRS 1.0 is like comparing F-14s to World War I biplanes. "2.0 is a tremendous step beyond 1.0," says Augie Roesler, Data Systems' manager of Material and Procurement Projects. The new system gives the planners direct – on-line – communication with the computers in Holtsville. It has some 200 batch programs, which are groups of instructions to handle large amounts of information.

Bob Ames, manager of Material Management Systems, and his team of analysts worked closely with Data Systems on the design of CRS. His group was also responsible for training the planners – a big concern long before the CRS switch was flipped. "We were apprehensive about the loss of productivity," he says. So they set up a classroom and put the planners through a minimum of 15 hours of intense training.

In Building 30, Material Management planners deal with huge amounts of data. There are over 51,000 discrete parts – from a single canopy bubble to a particular rivet used by the thousands – needed to build a single F-14. Just under 50,000 are needed to build a C-2A Greyhound. CRS stores and processes some 35 million pieces of parts information.

To be able to manipulate all that, Roesler says the Data Systems' programmer analysts had to write 100,000 lines of code. These are the instructions the computers follow. The analysts created 70 on-line screens which allow the planners to ask for information from the data base and manipulate data.

Before CRS, the planners did a lot of paper handling and prowling through volumes of printed data to identify requirements.

With CRS, the planners let the computer thumb through the cross-referenced data base for them. CRS cuts processing time dramatically. CRS spots errors as each entry is made in the creation of the long, detailed bills of materials. It also double checks the design engineers' requirements so that they conform to the engineering standards in Grumman's Material Data File.

In short, CRS just plain speeds things up. "A spares order might be 2,000 items long," says Jim Von Eschen, Requirements Planning manager. "Before CRS, a planner would manually input all the information. Then Data Systems would keypunch it into the computers for us. The printouts would come back and we'd check for errors."

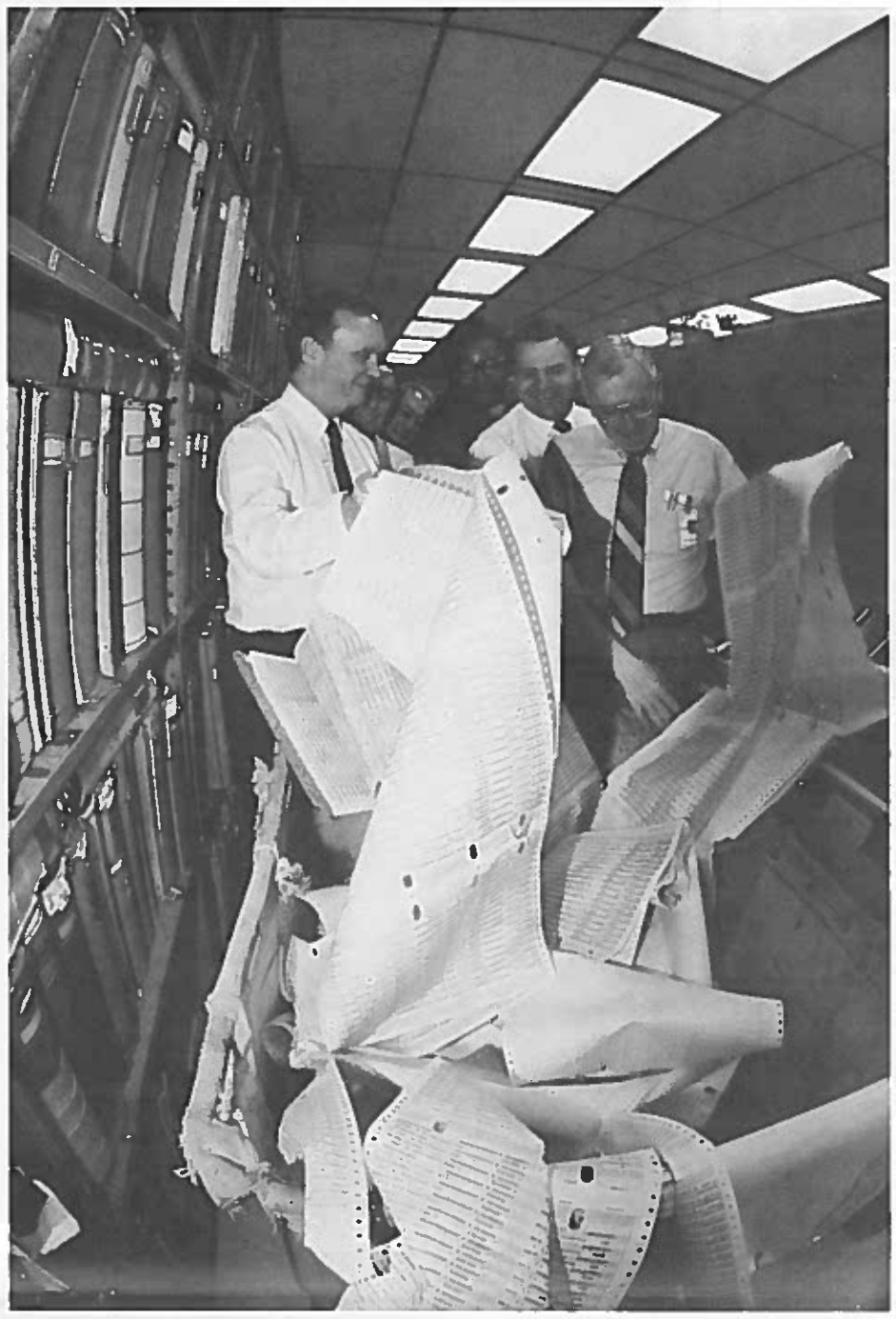
The beginning-to-end process sometimes took weeks beyond the normal four-week turnaround time. And if, months later, the order was repeated, Material Management's planners just went through the whole process again.

Now, a planner puts information directly into the computer, which checks each entry as it's made. If an order is a repeat, the planner just calls it up from the computer's memory, changes a few numbers and away it goes. A rush job no longer takes weeks.

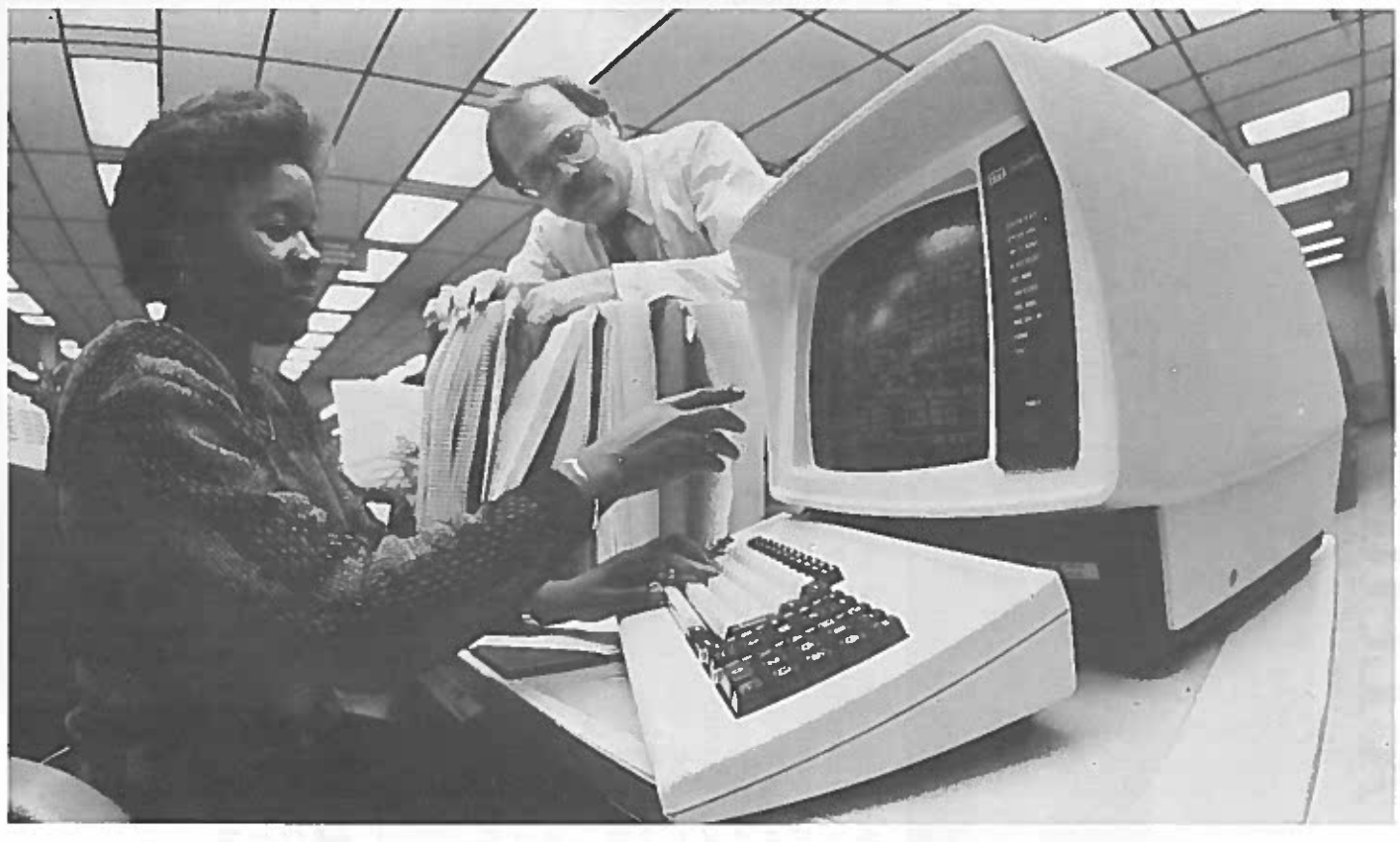
"The new CRS will save $350,000 a year in paper and printing costs alone," says Bill Vreeland, director of Material Planning.

Working with the new CRS is a far cry from his early career days in 1963. "We worked in a dark hovel in Plant 2. It looked like the smoke-filled room at an old-time political club. We literally did everything manually.

"The CRS is a welcomed addition to our operation," he adds. "It represents a significant step forward in a series of systems improvements that will take us to a totally paperless environment in the future." ■



Data Dump Extraordinaire. *It's a paperless world thanks to the new Corporate Requirements System. On February 18 when the new data system was turned on, (R) Tom Harding, director of Material Management;(L to R) Bill Vreeland, Frank Nosek, Fred Ruppenstein, Leon McAllister and Jim Von Eschen started throwing out tons of paperwork. The rest of the department joined in the paper purge, too.*



What's On The Tube? *On opening day, planner Linda McDonald tries out the new Corporate Requirements System. Planners in Material Management were able to go right to work on their computer screens, because of the training they received from Doug Schilling and the rest of the Material Management systems analysts. (Photos by Bob Settles)*

GrummanWorld

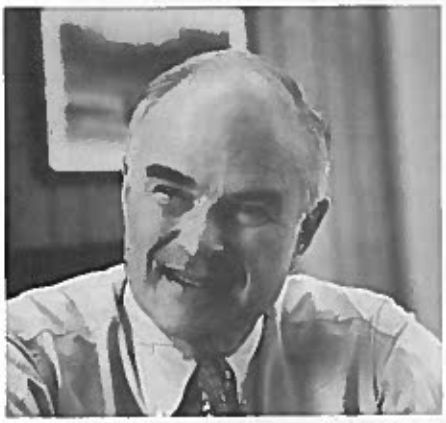
March 14, 1986

Photo by Karl Thoma

Getting Back Home By Barge And Guppy

Over the next two years, 25 F-14s built between 1969 and 1971 will be remanufactured at Calverton Operations on Long Island. The first batch of old Tomcats began arriving at Calverton late last year. Above, a barge filled with F-14s is unloaded at Jamesport, L.I., while another Tomcat (L) is flown into Calverton aboard a Guppy transport aircraft. (See article on page 3)

A Letter From The Chairman



On Wednesday morning, March 5, there was a terrible accident at the Bethpage railroad crossing on Grumman property. The crossing gates were down, signalling the approach of a train. Two Grummanites were in a car, waiting for the train to go past; they became impatient and ran the gate. The train was unable to stop in time. Mannie Eng, a 29-year-old assembler riveter, was pronounced dead at the scene. Daniel Carroll, a 29-year-old lab technician, died the next day.

There is little that can be said to comfort their families, their friends and their coworkers. But it is a sad lesson for us in the importance of obeying safety regulations.

Perhaps it's the belief that serious accidents occur only on the highways; maybe we delude ourselves that once we're inside the company fence, nothing terrible can happen to us. The posted speed limit is 25 miles per hour at most of our facilities; in some locations the limit is 10. There are stop signs, yield signs and pedestrian crossings – and our plant protection people are worried about how often these are ignored.

Seat belts have been proven to save lives – but notice sometime how many people don't bother to buckle up because they're just driving from one Grumman building to another.

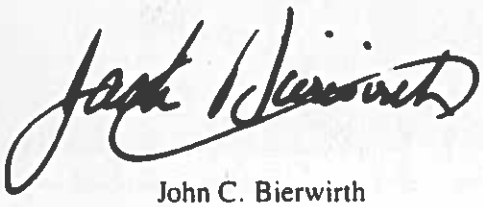
Last year, there were almost 200 automobile accidents at Grumman facilities all around the country. Most of those were fender benders, but 14 of them resulted in personal injuries.

Virtually all of them could have been prevented. And even though our accident rate has been fairly stable for the past few years, 200 accidents in one year is 200 accidents too many.

What happens at Grumman is just a smaller reflection of what happens to our people in the other parts of their lives. We have no record of how many car accidents Grummanites have on their own time – but running red lights, going through stop signs and driving too fast are increasingly common bad habits in a world where everyone is in a hurry.

Grumman people are our most precious resource. The accident in Bethpage on March 5 was the first fatal car accident in our company's history.

I pray that it will be the last.



John C. Bierwirth
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